



DEPARTMENT OF THE AIR FORCE
59TH MEDICAL WING (AETC)
JOINT BASE SAN ANTONIO - LACKLAND TEXAS



8 AUGUST 2017

MEMORANDUM FOR SGVT
ATTN: CAPT CLAIRE WIDULE

FROM: 59 MDW/SGVU

SUBJECT: Professional Presentation Approval

1. Your paper, entitled **Sonographic Evaluation of Rectus Abdominis Muscle Injuries** presented at/published to **American Society of Emergency Radiology, Toronto, Canada 6-9 Sept 2017** in accordance with MDWI 41-108, has been approved and assigned local file #**17278**.
2. Pertinent biographic information (name of author(s) title, etc.) has been entered into our computer file. Please advise us (by phone or mail) that your presentation was given. At that time, we will need the date (month, day and year) along with the location of your presentation. It is important to update this information so that we can provide quality support for you, your department, and the Medical Center commander. This information is used to document the scholarly activities of our professional staff and students, which is an essential component of Wilford Hall Ambulatory Surgical Center (WHASC) internship and residency programs.
3. Please know that if you are a Graduate Health Sciences Education student and your department has told you they cannot fund your publication, the 59th Clinical Research Division may pay for your basic journal publishing charges (to include costs for tables and black and white photos). We cannot pay for reprints. If you are a 59 MDW staff member, we can forward your request for funds to the designated Wing POC at the Chief Scientist's Office, Ms. Alice Houy, office phone: 210-292-8029; email address: alice.houy.civ@mail.mil.
4. Congratulations, and thank you for your efforts and time. Your contributions are vital to the medical mission. We look forward to assisting you in your future publication/presentation efforts.

LINDA STEEL-GOODWIN, Col, USAF, BSC
Director, Clinical Investigations & Research Support

PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

INSTRUCTIONS

USE ONLY THE MOST CURRENT 59 MDW FORM 3039 LOCATED ON AF E-PUBLISHING

1. The author must complete page two of this form:
 - a. In Section 2, add the funding source for your study [e.g., 59 MDW CRD Graduate Health Sciences Education (GHSE) (SG5 O&M); SG5 R&D; Tri-Service Nursing Research Program (TSNRP); Defense Medical Research & Development Program (DMRDP); NIH; Congressionally Directed Medical Research Program (CDMRP) ; Grants; etc.]
 - b. In Section 2, there may be funding available for journal costs, if your department is not paying for figures, tables or photographs for your publication. Please state "YES" or "NO" in Section 2 of the form, if you need publication funding support.
2. Print your name, rank/grade, sign and date the form in the author's signature block or use an electronic signature.
3. Attach a copy of the 59 MDW IRB or IACUC approval letter for the research related study. If this is a technical publication/presentation, state the type (e.g. case report, QA/QI study, program evaluation study, informational report/briefing, etc.) in the "Protocol Title" box.
4. Attach a copy of your abstract, paper, poster and other supporting documentation.
5. Save and forward, via email, the processing form and all supporting documentation to your unit commander, program director or immediate supervisor for review/approval.
6. On page 2, have either your unit commander, program director or immediate supervisor:
 - a. Print their name, rank/grade, title; sign and date the form in the approving authority's signature block or use an electronic signature.
7. Submit your completed form and all supporting documentation to the CRD for processing to:
usaf.jbsa.59-mdw.mbx.wing-crd-publications-and-presentations@mail.mil. **This should be accomplished no later than 30 days before final clearance is required to publish/present your materials.** If you have any questions or concerns, please contact the 59 CRD/Publications and Presentations Section at 292-7141 for assistance.
8. The 59 CRD/Publications and Presentations Section will route the request form to clinical investigations, 502 ISG/JAC (Ethics Review) and Public Affairs (59 MDW/PA) for review and then forward you a final letter of approval or disapproval.
9. Once your manuscript, poster or presentation has been approved for a one-time public release, you may proceed with your publication or presentation submission activities, as stated on this form. **Note:** For each new release of medical research or technical information as a publication/presentation, a new 59 MDW Form 3039 must be submitted for review and approval.
10. If your manuscript is accepted for scientific publication, please contact the 59 CRD/Publications and Presentations Section at 292-7141. This information is reported to the 59 MDW/CC. All medical research or technical information publications/presentations must be reported to the Defense Technical Information Center (DITC). See 59 MDWI 41-108, *Presentation and Publication of Medical and Technical Papers*, for additional information.
11. The Joint Ethics Regulation (JER) DoD 5500.07-R, *Standards of Conduct*, provides standards of ethical conduct for all DoD personnel and their interactions with other non-DoD entities, organizations, societies, conferences, etc. Part of the Form 3039 review and approval process includes a legal ethics review to address any potential conflicts related to DoD personnel participating in non-DoD sponsored conferences, professional meetings, publication/presentation disclosures to domestic and foreign audiences, DoD personnel accepting non-DoD contributions, awards, honoraria, gifts, etc. The specific circumstances for your presentation will determine whether a legal review is necessary. **If you (as the author) or your supervisor check "NO" in block 17 of the Form 3039, your research or technical documents will not be forwarded to the 502 ISG/JAC legal office for an ethics review.** To assist you in making this decision about whether to request a legal review, the following examples are provided as a guideline:

For presentations before professional societies and like organizations, the 59 MDW Public Affairs Office (PAO) will provide the needed review to ensure proper disclaimers are included and the subject matter of the presentation does not create any cause for DoD concern.

If the sponsor of a conference or meeting is a DoD entity, an ethics review of your presentation is not required, since the DoD entity is responsible to obtain all approvals for the event.

If the sponsor of a conference or meeting is a non-DoD commercial entity or an entity seeking to do business with the government, then your presentation should have an ethics review.

If your travel is being paid for (in whole or in part) by a non-Federal entity (someone other than the government), a legal ethics review is needed. These requests for legal review should come through the 59 MDW Gifts and Grants Office to 502 ISG/JAC.

If you are receiving an honorarium or payment for speaking, a legal ethics review is required.

If you (as the author) or your supervisor check "YES" in block 17 of the Form 3039, your research or technical documents will be forwarded simultaneously to the 502 ISG/JAC legal office and PAO for review to help reduce turn-around time. If you have any questions regarding legal reviews, please contact the legal office at (210) 671-5795/3365, DSN 473.

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement:

"The views expressed are those of the [author(s)] [presenter(s)] and do not reflect the official views or policy of the Department of Defense or its Components"

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement for research involving humans:

"The voluntary, fully informed consent of the subjects used in this research was obtained as required by 32 CFR 219 and DODI 3216.02_AFI 40-402."

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement for research involving animals, as required by AFMAN 40-401_IP :

"The experiments reported herein were conducted according to the principles set forth in the National Institute of Health Publication No. 80-23, Guide for the Care and Use of Laboratory Animals and the Animal Welfare Act of 1966, as amended."

PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS			
1. TO: CLINICAL RESEARCH	2. FROM: (Author's Name, Rank, Grade, Office Symbol) Claire Widule, Capt, O-3, 959 CSPS SGVT	3. GME/GHSE STUDENT: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	4. PROTOCOL NUMBER:
5. PROTOCOL TITLE: (NOTE: For each new release of medical research or technical information as a publication/presentation, a new 59 MDW Form 3039 must be submitted for review and approval.)			
6. TITLE OF MATERIAL TO BE PUBLISHED OR PRESENTED: Sonographic Evaluation of Rectus Abdominis Muscle Injuries			
7. FUNDING RECEIVED FOR THIS STUDY? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO FUNDING SOURCE:			
8. DO YOU NEED FUNDING SUPPORT FOR PUBLICATION PURPOSES: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
9. IS THIS MATERIAL CLASSIFIED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
10. IS THIS MATERIAL SUBJECT TO ANY LEGAL RESTRICTIONS FOR PUBLICATION OR PRESENTATION THROUGH A COLLABORATIVE RESEARCH AND DEVELOPMENT AGREEMENT (CRADA), MATERIAL TRANSFER AGREEMENT (MTA), INTELLECTUAL PROPERTY RIGHTS AGREEMENT ETC.? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO NOTE: If the answer is YES then attach a copy of the Agreement to the Publications/Presentations Request Form.			
11. MATERIAL IS FOR: <input type="checkbox"/> DOMESTIC RELEASE <input checked="" type="checkbox"/> FOREIGN RELEASE CHECK APPROPRIATE BOX OR BOXES FOR APPROVAL WITH THIS REQUEST. ATTACH COPY OF MATERIAL TO BE PUBLISHED/PRESENTED.			
<input type="checkbox"/> 11a. PUBLICATION/JOURNAL (List intended publication/journal.)			
<input type="checkbox"/> 11b. PUBLISHED ABSTRACT (List intended journal.)			
<input checked="" type="checkbox"/> 11c. POSTER (To be demonstrated at meeting: name of meeting, city, state, and date of meeting.) American Society of Emergency Radiology, Toronto, Canada, 9/6-9/9/2017			
<input type="checkbox"/> 11d. PLATFORM PRESENTATION (At civilian institutions: name of meeting, state, and date of meeting.)			
<input type="checkbox"/> 11e. OTHER (Describe: name of meeting, city, state, and date of meeting.)			
12. HAVE YOUR ATTACHED RESEARCH/TECHNICAL MATERIALS BEEN PREVIOUSLY APPROVED TO BE PUBLISHED/PRESENTED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO ASSIGNED FILE # _____ DATE _____			
13. EXPECTED DATE WHEN YOU WILL NEED THE CRD TO SUBMIT YOUR CLEARED PRESENTATION/PUBLICATION TO DTIC NOTE: All publications/presentations are required to be placed in the Defense Technical Information Center (DTIC).			
DATE 1 September 2017			
14. 59 MDW PRIMARY POINT OF CONTACT (Last Name, First Name, M.I., email) Sheldon, Lucas, M. lucas.m.sheldon.mil@mail.mil			15. DUTY PHONE/PAGER NUMBER 210-292-5282
16. AUTHORSHIP AND CO-AUTHOR(S) List in the order they will appear in the manuscript.			
LAST NAME, FIRST NAME AND M.I.	GRADE/RANK	SQUADRON/GROUP/OFFICE SYMBOL	INSTITUTION (If not 59 MDW)
a. Primary/Corresponding Author Widule, Claire, C.	O-3/Capt	959 CSPS/959 MDG/SGVP	SAMMC
b. Sheldon, Lucas, M.	O-5/Lt Col	59 RSQ CC	WHASC
c.			
d.			
e.			
17. IS A 502 ISG/JAC ETHICS REVIEW REQUIRED (JER DOD 5500.07-R)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
I CERTIFY ANY HUMAN OR ANIMAL RESEARCH RELATED STUDIES WERE APPROVED AND PERFORMED IN STRICT ACCORDANCE WITH 32 CFR 219, AFMAN 40-401_IP, AND 59 MDWI 41-108. I HAVE READ THE FINAL VERSION OF THE ATTACHED MATERIAL AND CERTIFY THAT IT IS AN ACCURATE MANUSCRIPT FOR PUBLICATION AND/OR PRESENTATION.			
18. AUTHOR'S PRINTED NAME, RANK, GRADE Claire Widule, Capt, O-3	19. AUTHOR'S SIGNATURE WIDULE.CLAIRE.C.1375363654 <small>Digitally signed by WIDULE.CLAIRE.C.1375363654 Date: 2017.07.11 14:48:30 -0500</small>		20. DATE July 10, 2017
21. APPROVING AUTHORITY'S PRINTED NAME, RANK, TITLE Lucas Sheldon, Lt Col, 59 RSQ CC	22. APPROVING AUTHORITY'S SIGNATURE SHELDON.LUCAS.M.1024563096 <small>Digitally signed by SHELDON.LUCAS.M.1024563096 Date: 2017.07.11 14:11:18 -0500</small>		23. DATE July 11, 2017

PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS		
1st ENDORSEMENT (59 MDW/SGVU Use Only)		
TO: Clinical Research Division 59 MDW/CRD Contact 292-7141 for email instructions.	24. DATE RECEIVED 12 Jul 2017	25. ASSIGNED PROCESSING REQUEST FILE NUMBER #17278
26. DATE REVIEWED 13 Jul 2017		27. DATE FORWARDED TO 502 ISG/JAC
28. AUTHOR CONTACTED FOR RECOMMENDED OR NECESSARY CHANGES: <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES If yes, give date. _____ <input type="checkbox"/> N/A		
29. COMMENTS <input checked="" type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED The poster presentation is approved.		
30. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER Rocky Calcote, PhD, Clinical Research Administrator	31. REVIEWER SIGNATURE CALCOTE ROCKY D. 1178245844 <small>Digitally signed by CALCOTE ROCKY D. 1178245844 DN: cn=US, ou=5. Government, ou=OCD, ou=PEI, ou=USAF email=ALCOTE.ROCKY.D.1178245844 Date: 2017.07.13 08:48:54 -0500</small>	32. DATE
2nd ENDORSEMENT (502 ISG/JAC Use Only)		
33. DATE RECEIVED		34. DATE FORWARDED TO 59 MDW/PA
35. COMMENTS <input type="checkbox"/> APPROVED (In compliance with security and policy review directives.) <input type="checkbox"/> DISAPPROVED		
36. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER	37. REVIEWER SIGNATURE	38. DATE
3rd ENDORSEMENT (59 MDW/PA Use Only)		
39. DATE RECEIVED July 31, 2017		40. DATE FORWARDED TO 59 MDW/SGVU July 31, 2017
41. COMMENTS <input checked="" type="checkbox"/> APPROVED (In compliance with security and policy review directives.) <input type="checkbox"/> DISAPPROVED		
42. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER Kevin Iinuma, SSgt/E-5, 59 MDW Public Affairs	43. REVIEWER SIGNATURE IINUMA KEVIN.MITSUGU.1296227 613 <small>Digitally signed by IINUMA KEVIN.MITSUGU.1296227613 DN: cn=US, ou=5. Government, ou=OCD, ou=PEI, ou=USAF email=KEVIN.MITSUGU.1296227613 Date: 2017.07.31 08:45:58 -0500</small>	44. DATE July 31, 2017
4th ENDORSEMENT (59 MDW/SGVU Use Only)		
45. DATE RECEIVED		46. SENIOR AUTHOR NOTIFIED BY PHONE OF APPROVAL OR DISAPPROVAL <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> COULD NOT BE REACHED <input type="checkbox"/> LEFT MESSAGE
47. COMMENTS <input type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED		
48. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER	49. REVIEWER SIGNATURE	50. DATE



Sonographic Evaluation of Rectus Abdominis Muscle Injuries

Claire C Widule¹, Lucas M Sheldon²

¹San Antonio Military Medical Center, San Antonio TX; ²Wilford Hall Ambulatory Surgical Center, San Antonio TX

Learning Objectives

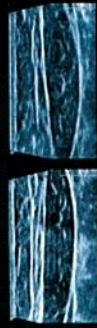
1. Recognize the benefits of utilizing ultrasound to evaluate rectus abdominis muscle injuries.
2. Understand the history, presentation and imaging appearance of a variety of rectus abdominis muscle injuries.

Background

Rectus abdominis muscle injuries are a rare, occasionally overlooked, cause of acute abdominal pain. Obtaining an appropriate clinical history is key to tailor the appropriate workup. Rectus abdominis muscle tears usually have a sudden onset during vigorous physical activity. The patient can typically tell you exactly when the injury occurred and point to a focal area of pain. Occasionally the presentation can be confused with abdominal wall hernias. If an adequate history is not obtained the presenting symptoms can be confused with intraabdominal pathology such as appendicitis or diverticulitis. Less common pathology, such as rhabdomyolysis, will have a delayed presentation with more diffuse pain and tenderness.

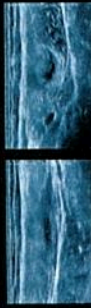
The majority of rectus abdominis muscle injuries at the author's institution are acute muscle tears during sit-ups in basic military training. These have a straightforward presentation and are evaluated with ultrasound for confirmation and characterization. Ultrasound demonstrates the size and severity of injury which provides important prognostic information. The rectus musculature is typically uniformly hypoechoic with hyperechoic septations traversing the muscle longitudinally. Muscle tears result in disruption of the normal muscle architecture and commonly a hypoechoic fluid-filled defect. Real-time evaluation may demonstrate enlargement of the defect during muscle contraction. Additional pathology that may be visualized includes rhabdomyolysis which has a variable sonographic presentation depending on the timing of injury.

Normal Rectus Abdominis



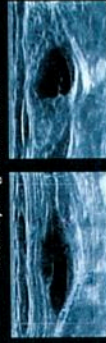
(Left) Longitudinal and (right) transverse images of normal left superior rectus abdominis demonstrate homogeneous hypoechoic muscle with hyperechoic internal septal separations.

Grade 2 Rectus Abdominis Tear

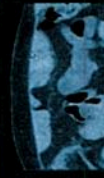


(Left) Longitudinal and (right) transverse images of the right superior rectus abdominis demonstrate a focal defect in the muscle. The defect is consistent with a Grade 2 tear.

Grade 2 Rectus Abdominis Tear with Layering Blood Products



Longitudinal and transverse images of the left inferior rectus abdominis demonstrate a heterogeneous hypoechoic and anechoic associated defect with a fluid-fluid level consistent with a grade 2 tear and a resolving hematoma with layering blood products. (Bottom) Axial non-contrast CT image through the lower abdomen demonstrates a focal area of increased attenuation within the left rectus with enlargement, consistent with a hematoma several weeks prior to the acquisition of above US.



Rectus Abdominis Rhabdomyolysis



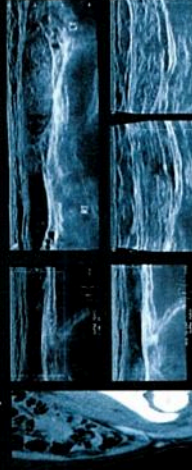
(Left) Longitudinal and (right) transverse US of left inferior rectus abdominis rhabdomyolysis (in same patient as prior example of Normal Rectus Abdominis) demonstrates diffuse muscle enlargement and heterogeneously increased echogenicity.

Grade 2 Rectus Abdominis Tear with Internal Degloving



(Above) Three longitudinal images of the left lower rectus abdominis demonstrate a focal hypoechoic defect with gross retraction of hyperechoic thickened muscle and no internal vascularity. (Left) Transverse image demonstrates anterior and focal hypoechoic integrity.

Near Complete Full Thickness Grade 3 and Concomitant Grade 1 Tears



(Left) Sagittal non-contrast CT through the right rectus abdominis demonstrates a full thickness muscular defect with collapse of the fascial sheath. (Middle column) Longitudinal images of the right rectus abdominis demonstrate an anechoic fluid-filled gap. The top image is more apical than the bottom image. (Top right) Transverse image of the right and left inferior rectus abdominis muscles demonstrate a near complete avulsion of the right rectus abdominis muscle. (Bottom right) Longitudinal image of the left rectus abdominis demonstrates a focal hypoechoic integrity with less significant architectural distortion.

Grade 1 Rectus Abdominis Tear



(Left) Longitudinal and (right) transverse images demonstrate focal hypoechoic integrity consistent with blood products with no significant architectural distortion or fluid-filled gap.

Small Full Thickness Grade 2 Rectus Abdominis Tear



(Left) Longitudinal and (right) transverse images of patient demonstrate focal right lower quadrant pain demonstrate a focal ill-defined hypoechoic defect in the longitudinal view and a complete hypoechoic defect in the transverse view.

Conclusion

Ultrasound is a fast, reliable tool in the evaluation of rectus abdominis muscle injuries and has the added benefit of being able to talk directly to the patient during the examination. An understanding of the normal sonographic appearance of rectus abdominis musculature will aid in identification of the most common injury, a muscle tear, as well as rare pathology such as rhabdomyolysis.

References

1. Hainline JR, et al. "Evaluation and grading of muscle injuries: a narrative review." *WJ Sports Med*. 2015;4(1):1-10.
2. Hainline JR, et al. "Evaluation and grading of muscle injuries: a narrative review." *WJ Sports Med*. 2015;4(1):1-10.
3. Hainline JR, et al. "Evaluation and grading of muscle injuries: a narrative review." *WJ Sports Med*. 2015;4(1):1-10.
4. Hainline JR, et al. "Evaluation and grading of muscle injuries: a narrative review." *WJ Sports Med*. 2015;4(1):1-10.

Disclaimer

The views expressed in this paper are those of the author and do not reflect the official views or policy of the Department of Defense or the Department of Veterans Affairs.



DEPARTMENT OF THE AIR FORCE
AIR EDUCATION AND TRAINING COMMAND



27 July 2017

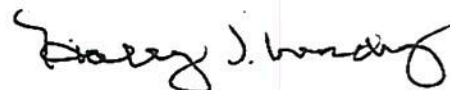
MEMORANDUM FOR 59 MDW/PUBLICATIONS AND PRESENTATIONS MANAGER

FROM: 502 ISG/JA

SUBJECT: Poster Presentation – American Society of Emergency Radiology

1. A request for a legal review of a poster presentation titled "Sonographic Evaluation of Rectus Abdominis Muscle Injuries" was submitted by the 59 MDW Publications and Presentation Manager. The poster presentation will be given by Capt Claire Widule and Lt Col Lucas Sheldon at the American Society of Emergency Radiology Meeting in Toronto, Canada on 6-9 September 2017. There is no information regarding whether the poster has been submitted to Public Affairs for review. It is submitted for legal review because the presentation will be given at a meeting held outside the country. There are no apparent conflicts of interest issues that would prohibit presentation of this material at a meeting held by a professional association. The fact the meeting will be held in Canada does not prohibit presentation of the material at this meeting.
2. FACTS: Capt Claire Widule and Lt Col Lucas Sheldon plan to make a poster presentation titled "Sonographic Evaluation of Rectus Abdominis Muscle Injuries." The poster presentation will be given at the American Society of Emergency Radiology Meeting in Toronto, Canada on 6-9 September 2017.
3. LAWS AND REGULATIONS: DoD 5500.07-R, Joint Ethics Regulation (JER), section 3-307 lays out rules governing "Teaching, Speaking and Writing." If the presentation will "deal in significant part with any ongoing or announced policy, program or operation" of the Air Force, the presenter is required to include a disclaimer that states the "views presented are those of the speaker or author and do not necessarily represent the views of DoD or its Components."
4. ANALYSIS: Although the presentation does not "deal in significant part with any ongoing or announced policy, program or operation" of the Air Force, the presentation does address information obtained during the presenter's government employment. Their affiliation and ranks are included on the poster. Capt Widule included the required disclaimer that the views presented are those of the presenter and do not necessarily represent the views of DoD or its Components on the poster. Public Affairs must review the presentation and approve it. There is no prohibition to presentation of this material at this professional meeting simply because it will be held in Canada.
5. CONCLUSIONS: The poster provided for review included the disclaimer required by the JER. There are no apparent conflicts of interest or issues that would prohibit publication.

6. If you have any questions, please call me at 671-5789.



HOLLY J. MACKEY
Attorney-Advisor

I concur.



MELANIE MCGHEE
Chief, Civil Law